



Bridging and repeating with WNDAP330

This document describes the different options to setup Bridging and Repeating (WDS – Wireless Distribution System) with two or more WNDAP330.

The Bridging and Repeating concepts described are valid for all the other Netgear products supporting WDS with new firmware (from May 2009).

Bridging and Repeating can be used in either 2.4 GHz or 5 GHz bands alternatively.

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Introduction – WDS

A **Wireless Distribution System (WDS)** is a system that allows access points to be wirelessly connected. WDS offers two modes of operation:

- 1- Wireless Repeating in which access points communicate only with each other and don't allow wireless clients or stations to access them.
- 2- Wireless Bridging in which the Access Points communicate with each other and with other the wireless clients.

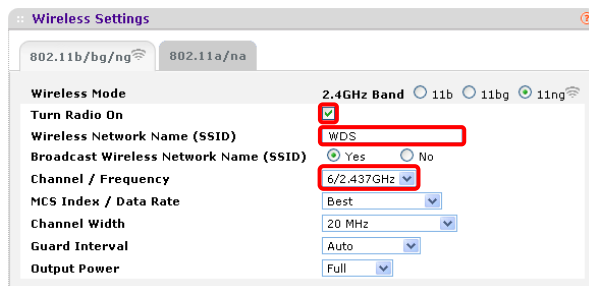
There are two different modes for Wireless Bridging: Point to Point and Point to Multipoint. The distinction is simple, if the Access Point must associate directly with only one other Access Point and Clients it uses Point to Point Bridging, if it must associate directly with more than one Access Point and Clients it uses Point to Multi-point Bridging.

Setup minimum requirements: SSID, Radio Channel, Encryption

In order to setup any of the three available Bridging and Repeating options, the following parameters must be set and be identical on all the APs:

- Wireless mode
- Wireless channel (except Auto)
- The Encryption level (this should be the same on each Point to Point link)

To perform the configuration access the GUI (Default URL <http://192.168.0.235>) and go to Configuration – Wireless – Basic – Wireless settings.



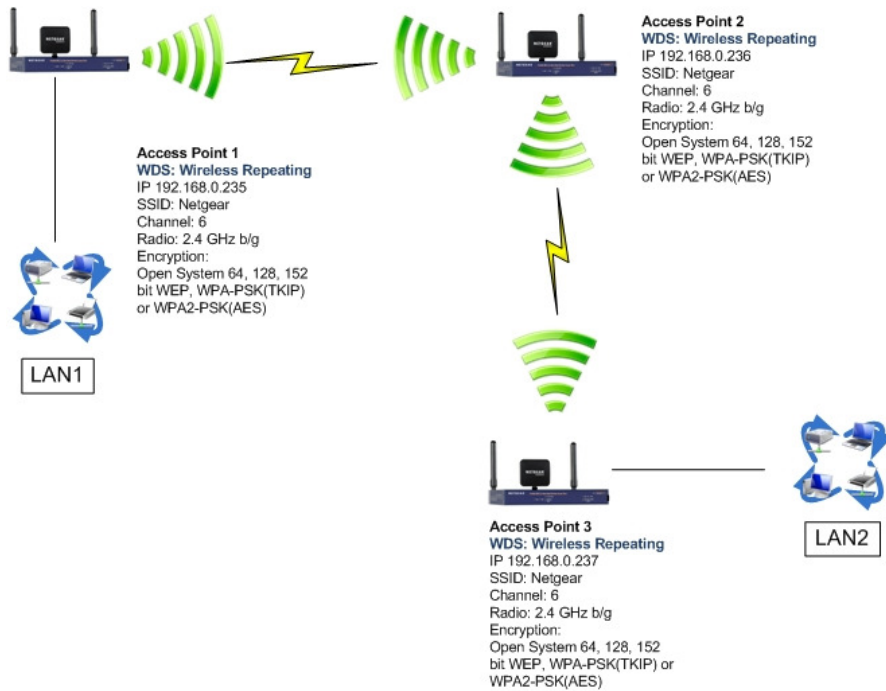
- Change the Wireless mode to 11bg and tick the **Turn Radio On** box (a message will advise the user to confirm if it is required to switch from 11ng to 11bg – click OK)
- Change the SSID to **WDS**
- Change channel to **6** (or any other channel depending on what is suitable in the local area – Just make sure it is the same for all Access Points)

NOTE: Although the SSID is not relevant for the setup of Bridging and Repeating it is possible to configure this to be the same on all the APs.

Wireless Repeating

This option is designed to allow extending the Wireless reach of an existing AP adding a maximum of two hops, in order to connect two locations in the same network. This option does not allow Wireless client association and the SSID will not be visible.

Since Repeater configurations communicate in half-duplex mode, the bandwidth decreases as you add Repeaters to the network. Also, you can extend the range of the wireless network with NETGEAR wireless antenna accessories.



Access Point 1

802.11b/bg/ng 802.11a/na

Enable Wireless Bridging and Repeating ☒

Local MAC Address 00:1e:2a:aa:d3:80 ①

☐ Wireless Point-to-Point Bridge ☐ Wireless Point to Multi-Point Bridge ☒ Repeater

#	Profile Name	Security	Enable
1	NETGEAR-WDS-1	Open System	☒
2	NETGEAR-WDS-2	Open System	☐
3	NETGEAR-WDS-3	Open System	☐
4	NETGEAR-WDS-4	Open System	☐

- In each Access Point, in the Wireless Bridge Page, enable **Wireless Bridging and Repeating** and select the option for **Repeater**.

Access Point 2

802.11b/bg/ng 802.11a/na

Enable Wireless Bridging and Repeating ☒

Local MAC Address 00:1e:2a:bb:25:90 ②

☐ Wireless Point-to-Point Bridge ☐ Wireless Point to Multi-Point Bridge ☒ Repeater

#	Profile Name	Security	Enable
1	NETGEAR-WDS-1	Open System	☒
2	NETGEAR-WDS-2	Open System	☒
3	NETGEAR-WDS-3	Open System	☐
4	NETGEAR-WDS-4	Open System	☐

- Note that two profiles will be enabled used in Access Point 2. As it is in the middle, it must connect to both Access Point 1 and Access Point 3.

Access Point 3

802.11b/bg/ng 802.11a/na

Enable Wireless Bridging and Repeating ☒

Local MAC Address 00:1e:2a:bb:25:50 ③

☐ Wireless Point-to-Point Bridge ☐ Wireless Point to Multi-Point Bridge ☒ Repeater

#	Profile Name	Security	Enable
1	NETGEAR-WDS-1	Open System	☒
2	NETGEAR-WDS-2	Open System	☐
3	NETGEAR-WDS-3	Open System	☐
4	NETGEAR-WDS-4	Open System	☐

- **Make note of the following:**

MAC Address of Access Point 1 = ①

MAC Address of Access Point 2 = ②

MAC Address of Access Point 3 = ③

Access Point 1

Profile Definition

Profile Name: NETGEAR-WDS-1

Remote MAC Address: ② 00:1E:2A:BB:25:90

Authentication Settings

Network Authentication: Open System

Data Encryption: 64 bit WEP

Passphrase: *****

WEP Key: B6E6806317

Generate Key

Access Point 2

Profile Definition

Profile Name: NETGEAR-WDS-1

Remote MAC Address: ① 00:1E:2A:AA:D3:80

Authentication Settings

Network Authentication: Open System

Data Encryption: 64 bit WEP

Passphrase: *****

WEP Key: *****

Generate Key

Profile Definition

Profile Name: NETGEAR-WDS-2

Remote MAC Address: ③ 00:1E:2A:BB:25:50

Authentication Settings

Network Authentication: Open System

Data Encryption: 64 bit WEP

Passphrase: *****

WEP Key: B6E6806317

Generate Key

Access Point 3

Profile Definition

Profile Name: NETGEAR-WDS-1

Remote MAC Address: ② 00:1E:2A:BB:25:90

Authentication Settings

Network Authentication: Open System

Data Encryption: 64 bit WEP

Passphrase: *****

WEP Key: B6E6806317

Generate Key

- Enter the MAC Address of Access Point 2 (②) in the **Remote MAC Address** field.

- Enter your **Network Authentication** details. Make sure the settings you use here are set identically in all Access Points.

- In the first profile, enter the MAC Address of Access Point 1 (①) in the **Remote MAC Address** field.

- Enter your **Network Authentication** details. Make sure the settings you use here are set identically in all Access Points.

- Enter the MAC Address of Access Point 3 (③) in the **Remote MAC Address** field.

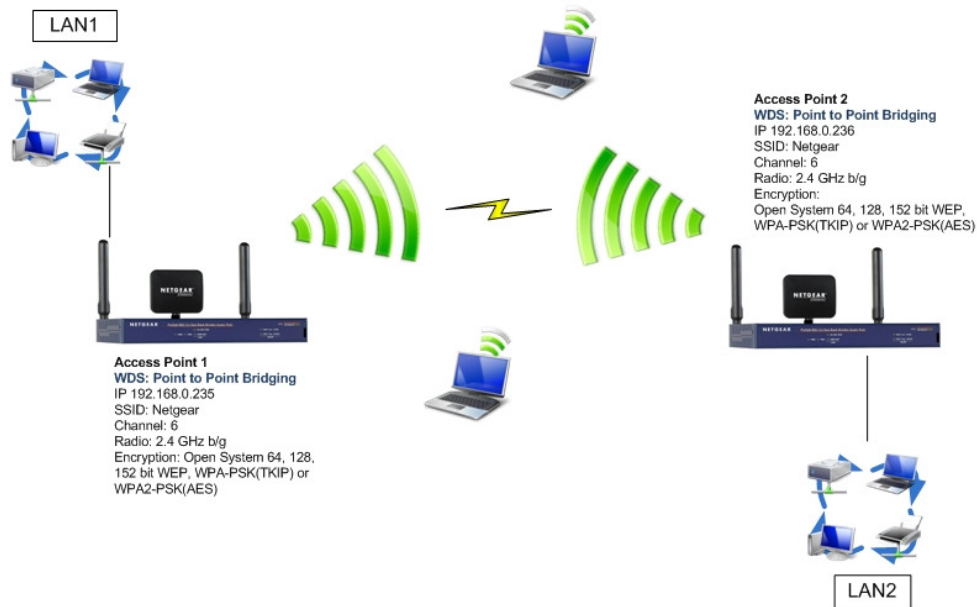
- Enter your **Network Authentication** details. Make sure the settings you use here are set identically in all Access Points.

- Enter the MAC Address of Access Point 2 (②) in the **Remote MAC Address** field.

- Enter your **Network Authentication** details. Make sure the settings you use here are set identically in all Access Points.

Wireless Point-to-Point Bridge

This option is designed to bridge wirelessly two locations in the same network.
By default when enabling this option Wireless client association will be possible, but this can be disabled.



Wireless Point-to-Point Configuration

Access Point 1

802.11b/bg/ng 802.11a/na

Enable Wireless Bridging and Repeating ☒

Local MAC Address 00:1e:2a:aa:d3:80 ①

☒ Wireless Point-to-Point Bridge ☐ Wireless Point to Multi-Point Bridge ☐ Repeater

Enable Wireless Client Association ☒

#	Profile Name	Security	Enable
1	NETGEAR-WDS-1	Open System	☒

- In each Access Point, in the Wireless Bridge Page, enable **Wireless Bridging and Repeating** and select the option for **Wireless Point-to-Point Bridge**

Access Point 2

802.11b/bg/ng 802.11a/na

Enable Wireless Bridging and Repeating ☒

Local MAC Address 00:1e:2a:bb:25:90 ②

☒ Wireless Point-to-Point Bridge ☐ Wireless Point to Multi-Point Bridge ☐ Repeater

Enable Wireless Client Association ☒

#	Profile Name	Security	Enable
1	NETGEAR-WDS-1	Open System	☒

- **Make note of the following:**

MAC Address of Access Point 1: ①

MAC Address of Access Point 2: ②

Click on the Edit button at the bottom of the screen to change the details of the profile you have enabled:

Access Point 1

Profile Definition

Profile Name NETGEAR-WDS-1

Remote MAC Address 00:1e:2a:bb:25:90 ②

Authentication Settings

Network Authentication Open System

Data Encryption 64 bit WEP

Passphrase

WEP Key

Generate Key

- Enter the MAC Address of Access Point 2 (②) in the **Remote MAC Address** field.
- Enter your **Network Authentication** details. Make sure the settings you use here are set identically in both Access Points.

Access Point 2

Profile Definition

Profile Name NETGEAR-WDS-1

Remote MAC Address 00:1E:2A:AA:D3:80 ①

Authentication Settings

Network Authentication Open System

Data Encryption 64 bit WEP

Passphrase

WEP Key

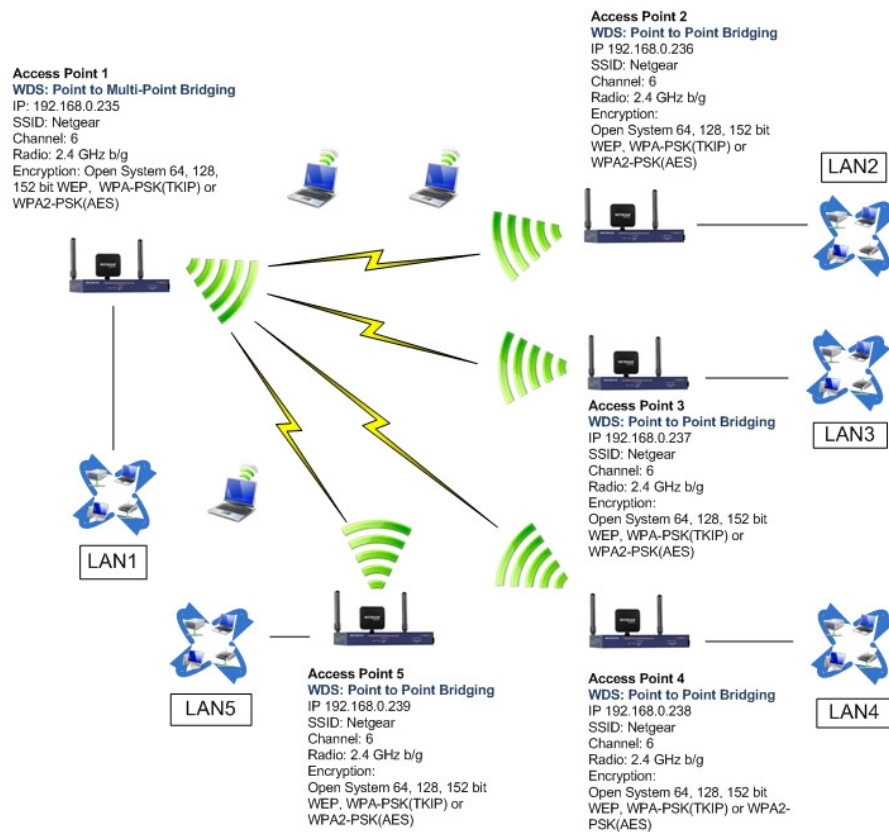
Generate Key

- Enter the MAC Address of Access Point 1 (①) in the **Remote MAC Address** field.
- Enter your **Network Authentication** details. Make sure the settings you use here are set identically in both Access Points.

Wireless Point to Multi-Point Bridge

This option is designed to allow connection of one central AP (Master) to other Bridge-Mode stations. Each of the stations will communicate sending traffic directly to the Master.

By default this option support the association with Wireless Clients which cannot be disabled.



Wireless Point to Multi-Point Configuration

Access Point 1

802.11b/bg/ng 802.11a/na

Enable Wireless Bridging and Repeating ☒

Local MAC Address 00:1e:2a:bb:25:90 **1**

☐ Wireless Point-to-Point Bridge ☒ Wireless Point to Multi-Point Bridge ☐ Repeater

#	Profile Name	Security	Enable
1	NETGEAR-WDS-1	Open System	☒
2	NETGEAR-WDS-2	Open System	☐
3	NETGEAR-WDS-3	Open System	☒
4	NETGEAR-WDS-4	Open System	☒

- On Access Point 1, in the Wireless Bridge Page, enable **Wireless Bridging and Repeating** and select the option for **Wireless Point to Multi-Point Bridge**.
- Enable as many profiles as you have Access Points; each profile will associate your central Access Point to one of the remote Access Points.
- Make note of the MAC Address of Access Point 1: **1**

Access Point 2

802.11b/bg/ng 802.11a/na

Enable Wireless Bridging and Repeating ☒

Local MAC Address 00:1e:2a:aa:d3:80 **2**

☐ Wireless Point-to-Point Bridge ☒ Wireless Point to Multi-Point Bridge ☐ Repeater

#	Profile Name	Security	Enable
1	NETGEAR-WDS-1	Open System	☒
2	NETGEAR-WDS-2	Open System	☐
3	NETGEAR-WDS-3	Open System	☐
4	NETGEAR-WDS-4	Open System	☐

- On Access Point 2, in the Wireless Bridge Page, enable **Wireless Bridging and Repeating** and select the option for **Wireless Point to Multi-Point Bridge**.
- Enable **one** profile to associate this remote Access Point to the central location.
- Make note of the MAC Address of Access Point 2: **2**

Repeat the steps for Access Point 2 on each of the other Access Points, making sure you take note of all the MAC Addresses.

Once you have gathered all the MAC addresses, and Wireless Bridging and Repeating has been enabled on all the Access Points, go back to Access Point 1 and select the first profile you enabled. Click on the **Edit** button at the bottom of the screen to change the details of the profile:

Access Point 1

The screenshot shows two panels. The top panel, titled "Profile Definition", has a "Profile Name" field with the value "NETGEAR-WDS-1" and a "Remote MAC Address" field with the value "00:1e:2a:bb:25:90". A red circle with the number "2" is next to the Remote MAC Address field. The bottom panel, titled "Authentication Settings", has "Network Authentication" set to "Open System", "Data Encryption" set to "64 bit WEP", and empty fields for "Passphrase" and "WEP Key". A "Generate Key" button is next to the Passphrase field.

- Enter the MAC Address of Access Point 2 (2) in the **Remote MAC Address** field.
- Enter your **Network Authentication** details. Make sure the settings you use here are set identically in both Access Points.

Repeat this procedure in each of the other profiles, assigning the MAC Addresses of Access Point 3, 4 and 5 respectively to each of the profiles. Note that the Network Authentication should be configured identically in each and all of the Access Points.

On Access Point 2, select the profile you enabled and click on the **Edit** button at the bottom of the screen to change the details of the profile:

Access Point 2, 3, 4 and 5

The screenshot shows two panels. The top panel, titled "Profile Definition", has a "Profile Name" field with the value "NETGEAR-WDS-1" and a "Remote MAC Address" field with the value "00:1E:2A:AA:D3:80". A red circle with the number "1" is next to the Remote MAC Address field. The bottom panel, titled "Authentication Settings", has "Network Authentication" set to "Open System", "Data Encryption" set to "64 bit WEP", and empty fields for "Passphrase" and "WEP Key". A "Generate Key" button is next to the Passphrase field.

- Enter the MAC Address of Access Point 1 (1) in the **Remote MAC Address** field.
- Enter your **Network Authentication** details. Make sure the settings you use here are set identically in both Access Points.

Repeat this same step in each of the other Access Points. They will all be configured in the exact same way: Same Network Authentication settings and the MAC address of Access Point 1 in the **Remote MAC Address** field.

Final Notes

- Bridging and Repeating will not reach 802.11n speeds even if one of the 11gn or 11an speeds are selected
- Bridging and Repeating can be setup using 2.4GHz or 5GHz alternatively
- When switching from 2.4 GHz to 5 GHz please note that :
 - The Wireless channel will reset to Auto
 - Bridging and Repeating will be disabled
 - All the Security profile will be reset to default